R&D since 1991 from 3% to 5% of sales.

DBT's emphasis on patenting as well as publishing is already beginning to pay off. Since January, DBT officials have helped five researchers with patent applications in biotechnology, and University of Delhi biochemist Debi Sarkar is preparing one on a technique that uses a genetically altered animal virus as a vector to deliver genes into liver cells (see table). "Six patents in 6 months from a single agency is a record in India," says Ghosh, whose agency is paying the cost—$5000 or more—of processing each patent. DBT is also negotiating with a U.S.-based biotechnology company for the rights to a set of monoclonal antibodies developed by Delhi's Vijay Chaudhary and used in a process that expresses foreign proteins on the surface of a virus.

The optimism about India's future in biotechnology is tempered by funding restraints. DBT's budget has grown by only $2 million in the past 2 years, and Bhatia admits that the department has not succeeded in pruning its lengthy list of research areas in medical biotechnology. "The prevailing situation of too few resources, spread too thin, will continue," he predicts.

In the face of tight budgets, the government wants to be sure that scarce funds are used to meet pressing national needs. "A lot of the work in the coming years will be aimed at developing products that are either not available from abroad or not suitable for India," says Prakash Tandon, head of a government task force on medical biotechnology. That means that continued support for the age-old problems of bacterial and parasite infections will divert some funding from research in such "new" areas as phage display technology, cytokine research, cancer at the molecular level, and human genetics.

Old or new, the research will be subject to a peer-review system meant to improve the quality of work at government-sponsored labs. The new system will enlist outside bodies, chosen either by DBT or the Indian Council of Medical Research, to review work on a regular basis. Already this spring, an HIV diagnostic kit developed at the DBT-funded International Center for Genetic Engineering and Biotechnology in New Delhi was tested by microbiologists at the National Institute of Virology, Pune, and at two hospitals before it was transferred to industry.

The more rigorous peer review is meant to reinforce the government's emphasis on scientific excellence. "We're telling scientists and industry that the only route to global competitiveness is innovation," says DBT's Ghosh.

–Ganapati Mudur

Ganapati Mudur is a science writer in New Delhi.

VIETNAM

Joint Dioxin Research Imperiled

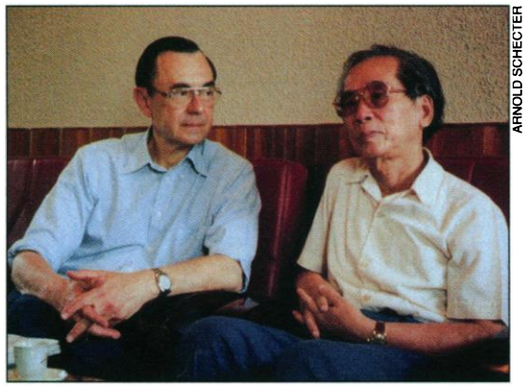
The freshly opened diplomatic ties between the United States and Vietnam are supposed to usher in an era of normal relations between the two former enemies. But don't try telling that to an international team of biologists, sponsored by the National Institutes of Health, who visited Vietnam last month to study the health effects of a defoliant used by U.S. forces during the Vietnam War. On 30 June, customs officials at Hanoi airport seized most of the research material collected during the trip, which explored potential collaborations to trace the impact on the population of Agent Orange, an herbicide contaminated with dioxin.

Among the confiscated items were blood and tissue samples that were to be tested for dioxin. This sort of analysis "is critical to any work done in Vietnam," says team leader Christopher Portier, a computational biologist at the National Institute of Environmental Health Sciences, which last year was ordered by Congress to explore potential research ties with Vietnam. However, only a few labs worldwide—and none in Vietnam—are capable of sophisticated analyses of dioxin, says University of Toronto pharmacologist Allan Okey, another member of the team.

The visiting researchers were given no reason for the seizure, although there are rumors that the incident reflects a feeling among some government officials that pursuing the matter—regardless of its potential scientific value—could jeopardize future ties with the United States. Until the U.S. State Department "figures out what went on," says Portier, he will delay any recommendation on whether the agency should participate in research projects with Vietnam.

The airport incident was only one of a series of problems encountered by the team, which was co-sponsored by the World Health Organization and was comprised of nine scientists from Canada, New Zealand, and the United States. Vietnamese officials twice delayed the trip, and 1 day before Portier left he was told by an official of the National Institute of Occupational and Environmental Health in Hanoi—the team's host—that "presentations on dioxin would not be allowed" at a 3-day pesticides conference in Hanoi. "We were wondering what the nine of us were supposed to talk about," says Arnold Schecter, a professor of preventive medicine at the State University of New York's Health Science Center and a member of the team. "The Vietnamese scientists [at the conference] were pleasant, but it was as if they were killing time."

Despite these hurdles, the Western scientists met individually with Vietnamese researchers and found "fantastic" opportunities for collaborations, says Paolo Toniolo, a professor of environmental medicine at New York University. Potential topics include exploring a link between birth defects and maternal dioxin levels and examining associations between Agent Orange exposure and cancer incidence as tallied by Vietnam's fledgling cancer registry.



ARNOLD SCHECTER

Unaccustomed trouble. Arnold Schecter hopes airport incident won't affect work with Hanoi's Hoang Dinh Cau.

But the immediate fruits of the trip never cleared customs. The officials seized a range of materials, including 40 blood samples from people exposed to Agent Orange in Laos, 26 samples of Vietnamese food—such as milk, fish, and beef—destined for a lab in Amsterdam, Netherlands, to be analyzed for dioxin, and scientific papers and other documents prepared by Vietnamese scientists. The customs officials "were clearly looking for anything that smelled like dioxin," says Toniolo. Schecter, who has made a dozen trips to Vietnam, said this was the first time Vietnamese officials have confiscated biological specimens from him.

As *Science* went to press, the State Department was still trying to broker a deal to have the materials released. "I'm hoping this turns out to be a tempest in a teapot," says Dennis Harter of State's Vietnam desk. But Harter says "it's up to the Vietnamese scientists and the authorities to work out" arrangements for future shipments of biological specimens.

Much good science will be lost if such arrangements cannot be made, say Western scientists. "Vietnamese dioxin scientists have been trying for years to get a group like ours to discuss dioxins," says Schecter. "But it's impossible to plan experiments of good quality if you have this kind of uncertainty."

–Richard Stone